

Serial No.: 10/722,242 (P2003J010)  
Amendment dated: 06/30/2006  
Reply to Office Action of: 04/04/2006  
Atty. Docket No.: JJK-0341

### **REMARKS**

The Examiner will note that claims 1 and 20 have been amended to specify the temperature and time for steaming. Support for this amendment is found on page 7, lines 8 -10.

### **THE EXAMINER'S REJECTION**

The Examiner rejected claims 1-25 under 35 U.S.C. 103(a) as being unpatentable over Young (US 4,423,266) in view of Keville (US 4,986,894).

The Young reference was cited as disclosing a process for isomerizing hydrocarbons. The process comprises contacting the hydrocarbon with a zeolite catalyst at isomerization conditions. Prior to use, the zeolite is steamed under conditions including temperatures ranging from 250° to 1000°C and steaming times ranging from 15 min to 100 hours. Zeolites used in the catalyst include ZSM-23, ZSM-35 and ZSM-48. The zeolites are unidimensional, 10-ring medium pore zeolites. The catalyst may also include a Group VIII metal and a binder such as clay, silica or alumina. The relative proportions of zeolite to binder range from about 1 to 99 percent by weight. See column 1, lines 57-66; column 3, lines 19-31; column 5, lines 4-36; column 7, lines 24-28 and 38-68; and column 9, lines 61-68.

The Young reference does not disclose the hydroisomerization conditions or the use of a C10+ feed, does not disclose the alpha value of the steamed catalyst in relation to the unsteamed catalyst, does not disclose platinum in the

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catalyst, does not disclose the steaming condition ranges, and does not disclose the product selectivity improvement.

The Keville reference discloses the isomerization of C10+ feeds over platinum and zeolite catalysts. The isomerization conditions include temperatures ranging from 480° to 930°F and pressures ranging up to 3600 psi. The Keville reference also discloses that the catalyst should have low acidity. See column 2, lines 59-68; column 3, lines 1-13 and 33-42; and column 9, lines 31-50.

The Examiner concludes that it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process of Young by utilizing the feed and the conditions disclosed by Keville because the isomerization of C10+ feeds results in products of improved flow properties and because these conditions are effective for the desired isomerization reactions of Young.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the steaming conditions within the ranges disclosed by Young so that the alpha value of the steamed catalyst does not exceed the alpha value of the unsteamed catalyst as claimed because increasing the alpha value would increase hydrocracking activity. This is not desired in an isomerization process. By obtaining a steamed catalyst as claimed, product selectivity improvement as claimed would also result.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to include platinum in the catalyst of Young as

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suggested by Keville because platinum effectively promotes the isomerization reactions.

### **APPLICANTS' RESPONSE**

As set forth in amended claim 1, three combined features of claim 1 that distinguish over the cited art are:

1. Steaming in a specified range;
2. Unidimensional zeolite; and
3. Increase in alpha value (higher acidity) leading to improved selectivity in the isomerization process.

The Young reference makes no distinction between 1-D and 3-D (3-dimensional) zeolites. In fact, the preferred zeolite is ZSM-5 (col. 6, lines 13-14) which zeolite is outside the scope of applicants' claims as it is a 3-D zeolite. Also preferred is the addition of a phosphorus pretreatment step. The result is reduced coke formation and aging rate (col. 1, lines 57-63). Moreover, the isomerization of Young appears to relate to isomerization of reactants like xylene, not C10+ hydrocarbons. Example 4 of Young describes the isomerization of xylene.

The Keville reference was relied on as disclosing the isomerization of C10+ feeds over Pt and zeolite catalysts. Keville does state that a Pt/zeolite catalyst can be used for the isomerization of C10+ feeds. The zeolite of Keville is MCM-22. The Examiner states that it would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the steaming conditions within the ranges disclosed by Young so that the alpha value of the steamed catalyst does not exceed the alpha value of the unsteamed catalyst as claimed

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because increasing the alpha value would increase hydrocracking activity. This is not desired in an isomerization process.

In contrast to Keville and the Examiner's conclusion, applicants are claiming a process in which the alpha value of a steamed unidimensional zeolite is increased over the unsteamed value, provided that steaming occurs within the temperatures outlined in claim 1. The resulting steamed zeolite with increased alpha value shows improved isomerization selectivity of C10+ feeds. This could not have been derived as obvious from the teachings of Young and Keville since the combination teaches away from applicants' invention. According to the combined references and the Examiner's conclusion, steaming should decrease the alpha value, not increase it as is the case in applicants' claimed invention.

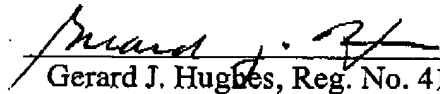
For the reasons noted above, it is urged that applicants have made a patentable advance in the art. Favorable action and early allowance is respectfully solicited.

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Based on the preceding arguments and amendments, the Examiner is requested to reconsider and withdraw all objections and rejections and pass this application to allowance. The Examiner is encouraged to contact applicants' attorney should the Examiner wish to discuss this application further.

Respectfully submitted:

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